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Claims

[c1] 1. An apparatus for supplying sealing air to an exhaust turbine (15), said exhaust turbine (15)which interacts with an internal combustion engine for turbo-compound operation in a vehicle, exhaust gases from the internal combustion engine being received in an exhaust system having a supercharger turbine (11), which drives a compressor (13) for the engine combustion air, residual energy in the exhaust gas flow being recovered via the exhaust turbine (15) for transfer to the crankshaft of the internal combustion engine, the exhaust turbine (15) being supported in a bearing housing (32), which is fed with sealing air via a fluid line (36), and the exhaust system comprising an exhaust brake throttle (16) having an exhaust gas pressure regulator (22) for regulating the exhaust brake pressure, the exhaust gas pressure regulator (22) is connected via a compressed air line (28) to a compressed air source (29, 30) connectable in parallel to the bearing housing (32) via a prioritizing valve (35) and a compressed air line (36).

[c2] 2. The apparatus as recited in claim 1, wherein the prioritizing valve (35) enables the bearing housing (32) to be

connected to the engine inlet manifold (14) via a compressed air line (38).

[c3] 3. The apparatus as recited in claim 1, wherein the exhaust brake throttle (16) comprises an exhaust throttle valve (19) located in the exhaust system downstream of the exhaust gas pressure regulator (22).

[c4] 4. The apparatus as recited in claim 1, wherein the exhaust gas pressure regulator comprises a piston valve (22) having a first piston surface (23) acted upon by the exhaust gas pressure when the exhaust brake throttle (16) is closed, and a second opposed piston surface (25) which is firmly connected to the first piston surface and is acted upon by the pressure in the compressed air line (28).

[c5] 5. The apparatus as recited in claim 4, wherein the second piston surface (25) has a smaller area than the first piston surface, the piston valve (22) being capable of opening a bypass line (21) bypassing the exhaust brake throttle (16) when the first piston surface (23) of the piston valve be acted upon by an exhaust gas pressure smaller than the pressure prevailing in the circuit which is formed by the compressed air lines (28, 36) and the prioritizing valve (35) and which delivers pressure to the second piston surface (25) of the piston valve or to the

bearing housing (32).

[c6] 6. The apparatus as recited in claim 1, wherein the compressed air line (28) is connected to a valve unit (31) located between compressed air source (29, 30) and the prioritizing valve (35) and which supplies an overpressure variable from a standby level to a higher level adjustable in proportion to the required engine brake power.

[c7] 7. The apparatus as recited in claim 1, wherein during normal engine operation, the prioritizing valve (35) delivers sealing air to the bearing housing (32) from the engine inlet manifold (14).

[c8] 8. The apparatus as recited in claim 1, wherein during low engine load operation, the prioritizing valve (35) delivers sealing air to the bearing housing (32) from the compressed air line (28) at a pressure equal to the standby level.

[c9] 9. The apparatus as recited in claim 1, wherein under engine braking conditions, the prioritizing valve (35) delivers sealing air to the bearing housing (32) from the compressed air line (28) at a pressure equal to a higher pressure level.

[c10] 10. A method for maintaining an overpressure condition

in a bearing housing of an exhaust gas turbine that constitutes a portion of a vehicle-powering turbo-compound internal combustion engine arrangement, said method comprising:

supplying overpressure air of a first magnitude to a bearing housing of an exhaust gas turbine constituting a portion of a vehicle-powering turbo-compound internal combustion engine arrangement during non-engine braking operating conditions of the incorporating vehicle; and

increasing the magnitude of the supplied overpressure air to the bearing housing responsive to the detection of a transition from non-engine braking operating conditions to engine braking operating conditions to a second magnitude.

[c11] 11. The method as recited in claim 10, further comprising:

utilizing a reciprocating piston arrangement having two oppositely acting piston surfaces to detect transitions between non-engine braking operating conditions and engine braking operating conditions.

[c12] 12 The method as recited in claim 10, further comprising:

pressuring said bearing housing utilizing supercharged engine inlet air during non-engine braking operating

conditions; and

increasing the magnitude of the supplied overpressure air to the bearing housing utilizing, at least partially, pressured air from an onboard compressed air supply also utilized for supplying other vehicle subsystems.